Community pharmacy personnel interventions for smoking cessation (Review)

Sinclair HK, Bond CM, Stead LF

This is a reprint of a Cochrane review, prepared and maintained by The Cochrane Collaboration and published in *The Cochrane Library* 2008, Issue 4

http://www.thecochranelibrary.com

TABLE OF CONTENTS

[Intervention Review]

Community pharmacy personnel interventions for smoking cessation

Hazel K Sinclair[1], Christine M Bond[1], Lindsay F Stead[2]

[1]Department of General Practice and Primary Care, University of Aberdeen, Aberdeen, UK. [2]Department of Primary Health Care, University of Oxford, Oxford, UK

Contact address: Hazel K Sinclair, Department of General Practice and Primary Care, University of Aberdeen, Foresterhill Health Centre, Westburn Road, Aberdeen, AB25 2AY, UK. h.sinclair@abdn.ac.uk.

Editorial group: Cochrane Tobacco Addiction Group.
Publication status and date: Edited (no change to conclusions), published in Issue 4, 2008.
Review content assessed as up-to-date: 30 October 2007.

Citation: Sinclair HK, Bond CM, Stead LF. Community pharmacy personnel interventions for smoking cessation. *Cochrane Database of Systematic Reviews* 2004, Issue 1. Art. No.: CD003698. DOI: 10.1002/14651858.CD003698.pub2.

ABSTRACT

Background

Smoking cessation is a potentially appropriate role for community pharmacists because they are encouraged to advise on the correct use of nicotine replacement therapy (NRT) products and to provide behavioural support to aid smoking cessation.

Objectives

This review assessed the effectiveness of interventions by community pharmacy personnel to assist clients to stop smoking.

Search strategy

A search was made of the Cochrane Tobacco Addiction Group database for smoking cessation studies conducted in the community pharmacy setting, using the search terms pharmacist* or pharmacy or pharmacies. Date of the most recent search: October 2007.

Selection criteria

Randomized trials which compared interventions by community pharmacy personnel to promote smoking cessation amongst their clients who were smokers compared to usual pharmacy support or any less intensive programme. The main outcome measure was smoking cessation rates at six months or more after the start of the intervention.

Data collection and analysis

Data were extracted by one author and checked by the second, noting: the country of the trial, details of participant community pharmacies, method of subject recruitment, smoking behaviour and characteristics of participants on recruitment, method of randomization, description of the intervention and of any pharmacy personnel training, and the outcome measures.

Methodological quality was assessed according to the extent to which the allocation to intervention or control was concealed. Because of the potentially important cluster effects, we also rated trials according to whether they checked for or adjusted for these but, in the absence of consensus on how to pool cluster level data, we adopted a narrative approach to synthesizing the data, rather than a formal meta-analysis.

Main results

We identified two trials which met our selection criteria. They included a total of 976 smokers. Both trials were set in the UK and involved a training intervention which included the Stages of Change Model; they then compared a support programme involving counselling and record keeping against a control receiving usual pharmacy support. In both studies a high proportion of intervention and control participants began using NRT.

Both studies reported smoking cessation outcomes at three time points. However, the follow-up points were not identical (three, six and 12 months in one, and one, four and nine months in the other), and the trend in abstinence over time was not linear in either study, so the data could not be combined. One study showed a significant difference in self-reported cessation rates at 12 months: 14.3% versus 2.7% ($p < 0.001$); the other study showed a positive trend at each follow-up with 12.0% versus 7.4% ($p = 0.09$) at nine months.

Authors' conclusions

The limited number of studies to date suggests that trained community pharmacists, providing a counselling and record keeping support programme for their customers, may have a positive effect on smoking cessation rates. The strength of evidence is limited because only one of the trials showed a statistically significant effect.

PLAIN LANGUAGE SUMMARY

Trained community pharmacy personnel may be able to help people who wish to stop smoking

Personnel in community pharmacies (drug stores) can be a source of information and support for people trying to quit smoking. They may have a role because nicotine replacement therapy, an effective cessation pharmacotherapy, is available without prescription in many countries. People also come to pharmacies with prescriptions for medications to help them quit. The review included two trials and found limited evidence that training pharmacy personnel to offer counselling and record keeping services to their customers may help smokers to quit.

BACKGROUND

The community pharmacist is one of the only health care professionals who has regular interactions with large numbers of people 'in health' as well as 'in sickness' (HEA 1994). This should provide an excellent opportunity for pharmacists to contribute to health promotion and disease prevention activities in collaboration with other healthcare providers. All of the commercially available forms of nicotine replacement therapy (NRT) are effective in promoting smoking cessation, increasing quit rates 1.5- to 2-fold regardless of setting (Silagy 2004). Smoking cessation is a particularly appropriate role for the community pharmacist because NRT is available without prescription in many countries, although not necessarily in all of its many formulations (nicotine chewing gum, transdermal patches, nasal spray, inhalators, sublingual tablets and lozenges). Bupropion is also available to patients as a prescription only medicine and therefore largely supplied through pharmacies.

In the United Kingdom (UK), pharmacists are encouraged to advise on the correct use of NRT products (Royal Pharmaceutical Society, RPS 1999) and to provide a structured package of behavioural support to aid smoking cessation (West 2000). However, pharmacists have identified a number of barriers that can inhibit them from participating in smoking cessation activities, including dispensing duties (Anderson 2003), lack of counselling skills (Vitale 2000), pharmacist interpersonal characteristics, practice site considerations, patient characteristics and financial concerns (Williams 2000).

Training health professionals in smoking cessation counselling has a measurable effect on professional performance, but there is no strong evidence that it changed clients' smoking behaviour (Lancaster 2000; Hudmon 2004). However, an understanding of the trans-theoretical model could improve the effectiveness of counselling in the pharmacy setting (Vitale 2000; Hudmon 2001). Although smoking cessation training for pharmacy students has been shown to increase perceived confidence and ability to provide counselling (Corelli 2005, Hudmon 2004), the lack of curriculum time and lack of experiential training opportunities is still a

problem for some pharmacy schools to cover this topic adequately (Hudmon 2005).

Evidence supports the wider provision of smoking cessation through community pharmacies (Blenkinsopp 2003). It has been shown that pharmacists can play a role in offering counselling to smokers (Wick 2000; Babar 2007), that health promotion advice on smoking cessation from trained community pharmacists is valued by their customers (Gschwend 1999; Blenkinsopp 2002; Hudmon 2003), that community pharmacists who counsel patients can improve smoking cessation rates (Smith 1995; Barbero 2000), that a pharmacist-based smoking cessation programme can improve the health-related quality of life of patients during their cessation attempt (Zillich 2002) and that pharmacy interventions can be cost-effective (McGhan 1996; Crealey 1998; Sinclair 1999b; Tran 2002).

Although the above literature indicates that pharmacists have a useful role to play in smoking cessation, many of the studies cited do not meet the strict criteria required for definitive statements. The aim of this review was therefore to identify the most rigorous studies which could allow us to say with confidence whether or not community pharmacists have a role to play in assisting their clients to stop smoking.

OBJECTIVES

This review assessed the effectiveness of interventions by community pharmacy personnel to assist clients to stop smoking.

METHODS

Criteria for considering studies for this review

Types of studies

Randomized controlled trials.

Types of participants

Community pharmacy clients who are smokers and who wish to stop.

Types of interventions

Any intervention by community pharmacy personnel to promote smoking cessation amongst their clients. The intervention may have been delivered by one or more pharmacists and/or members of pharmacy staff. They may have included advice or more intensive behavioural therapy, with or without the use of any form of NRT or other pharmacotherapy. The control intervention may have been usual pharmacy support or any less intensive programme. Pharmaceutical trials which compared only NRT with a control in the community pharmacy setting did not fall within the scope of this review.

Types of outcome measures

The primary outcome measure of the review was rates of abstinence from smoking six months or more after the start of the intervention. We excluded studies with shorter follow-up. Participants lost to follow-up were regarded as being continuing smokers.

Search methods for identification of studies

We searched the Cochrane Tobacco Addiction Group trials register for smoking cessation studies conducted in the community pharmacy setting, using the search terms pharmacist* or pharmacy or pharmacies in the title, abstract or keywords. The register includes controlled trials of interventions for smoking cessation identified from searches of electronic databases including MEDLINE, SCISEARCH and PsycINFO, and hand-searching of conference abstracts. We also searched EMBASE using the terms ((pharmacist* or pharmacy* or pharmacies) in TI or SU) and (smoking cessation). Date of the most recent search: October 2007.

Data collection and analysis

Data extraction

Studies generated by the search strategy were reviewed by the two authors, according to the inclusion criteria. Data were extracted by one author (HS) and checked by a second (CB). The following information was noted:

- Country of the trial
- Details of participant community pharmacies: type of pharmacy practice; context under study
- Method of subject recruitment to the study
- Smoking behaviour and characteristics of participants on recruitment: whether current smokers or recent quitters; whether selected according to willingness to make a quit attempt; age, sex, and average baseline cigarette consumption
- Other relevant inclusion/exclusion criteria for the trial
- Method of randomization
- Description of the intervention
- Description of any pharmacy personnel training
- Outcome measures: definition of smoking abstinence at the longest follow-up; use of biochemical validation
- Reasons for the non-inclusion of the studies

Methodological quality

We assessed the methodological quality of the included studies by the extent to which the allocation to intervention or control was

concealed. Because of the potentially important cluster effects, we also rated trials according to whether they checked for or adjusted for cluster effects.

Analysis of the data

In trials which are cluster-randomized, analyses based on individuals rather than on the unit of allocation (e.g. pharmacy or provider) may introduce unit of analysis errors. Using statistical methods which assume, for example, that all the clients' chances of quitting were independent would ignore the possible similarity between outcomes for clients seen by the same provider. This may underestimate standard errors and give misleadingly narrow confidence intervals, giving rise to the possibility of Type One error (Altman 1997). Trials may use a variety of statistical methods to investigate or compensate for clustering. We recorded whether studies used these methods, and whether the significance of any effect was consequently altered. In the absence of consensus on how to pool cluster level data, we planned to adopt a narrative approach to synthesizing the data, rather than a formal meta-analysis.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies.

We identified two randomized controlled trials, both conducted in the UK, which investigated the issue of community pharmacy support for smoking cessation (Sinclair 1998; Maguire 2001). The studies included a total of 976 smokers with similar numbers in each, and 51 pharmacies in one study (Maguire 2001) and 60 in the other (Sinclair 1998). Both studies involved training interventions which included the Stages of Change Model: a three-hour workshop for pharmacists plus one outreach visit (Maguire 2001), and a two-hour workshop for pharmacists and pharmacy assistants (Sinclair 1998). The Maguire study used the Pharmacists' Action on Smoking (PAS) scheme which has been reported elsewhere (Maguire 1995; Maguire 1996; Maguire 1997). Both studies compared a support programme of counselling and record keeping with a control group who received a normal service from pharmacy personnel. Maguire 2001 randomized by customer, using a sealed envelope technique (Altman 1982), while Sinclair 1998 used a cluster design with the pharmacy as the unit of randomization. The Maguire study recruited customers who expressed a wish to stop smoking (265 intervention, 219 controls); a similar proportion in each arm started to use NRT (87% intervention, 84% controls). The Sinclair study recruited pharmacy customers seeking advice on stopping smoking or buying an over-the-counter (OTC) anti-smoking product at the start of a new attempt to stop smoking (224 intervention, 268 controls); a similar proportion in each arm started to use NRT (98% intervention, 93% controls).

Follow-up points in the Maguire study were at three, six and 12 months, while the Sinclair study followed up at one, four and nine months. In both studies, the smoking cessation outcome at final follow-up was continuous abstinence. In both studies, follow-up was by postal questionnaire and depended on self-reported smoking status. This was validated by cotinine in one study (Maguire 2001).

One study (Maguire 2001) paid pharmacists £15 for each smoker enrolled and followed up for 12 months.

Both studies used qualitative methods to evaluate the intervention process. Maguire 2001 conducted telephone interviews and focus groups with participating pharmacists. The other study used telephone interviews with customers, pharmacists and pharmacy assistants (Sinclair 1997; Sinclair 1998). Sinclair also developed a postal questionnaire to compare the knowledge and attitudes of the intervention and control pharmacists and pharmacy assistants at two, 12, 24 and 36 months after the training workshop (Sinclair 1999a).

Risk of bias in included studies

Neither trial was considered to have used an approach which ensured adequate concealment of allocation. Although Maguire 2001 used sealed envelopes, the process remains unclear because of the disparity between the numbers in the control and intervention groups (controls markedly fewer). The Sinclair trial was cluster randomized, with the pharmacy as the unit of randomization, and pharmacies sequentially allocated to the training intervention or to no training (Sinclair 1998). In Maguire 2001 randomization was by participant. In Sinclair 1998 the unit of randomization was the pharmacy, so it could not be assumed that the individuals included in the analysis were independent of each other (a reasonable assumption had the randomization been by participant). However, the degree of intra-cluster randomization was shown to be negligible, so that the randomization by pharmacy had no effect on the variance of the regression coefficients and the results could therefore be treated as if randomization were by participant. Nevertheless we decided against pooling the data from the two studies, because the trend in abstinence over time was not linear in either study and the follow-up time points were not identical. Since however it is usual for Cochrane reviews on tobacco addiction to attempt to pool clinically similar trials, ignoring small differences in length of follow-up, we also considered whether pooling would alter our findings.

Cotinine validation of self-reported cessation at 12 months was reported in one study (Maguire 2001). No biochemical validation was carried out in the other study (Sinclair 1998).

Effects of interventions

In both studies, we assumed that non-responders were continuing smokers.

In Maguire 2001, three months' continuous abstinence was claimed by 27.5% of the intervention group and by 11.0% of the controls; six months' continuous abstinence was claimed by 18.5% of the intervention group and by 8.2% of the controls; and cotinine-validated continuous abstinence was claimed at 12 months by 14.3% of the intervention group and by 2.7% of the controls ($p < 0.001$) . The 12 month cessation rates were robust to potential confounders (type or size of pharmacy, and gender or age of the pharmacist involved in the study).

In Sinclair 1998, one month point prevalence abstinence was claimed by 29.9% of the intervention group and by 23.6% of the controls ($p = 0.12$); four months' continuous abstinence was claimed by 16.1% of the intervention group and by 10.9% of the controls ($p = 0.094$); and nine months' continuous abstinence was claimed by 12.0% of the intervention group and by 7.4% of the controls ($p = 0.089$). These trends in outcome were robust to potential confounders (gender, age, socio-economic status, nicotine dependency at recruitment and type of NRT product used), and to adjustment for clustering.

Pharmacists were positive about the Pharmacists' Action on Smoking (PAS) model and felt that a knowledge of the Cycle of Change was valuable when attempting to change clients' smoking behaviour (Maguire 2001). Pharmacists identified time constraints and insufficient remuneration for the service as the main barriers to their more active participation in the smoking cessation programme (Maguire 2001). They felt that a multi-disciplinary approach to smoking cessation was required and highlighted a need to improve relationships with local general practitioners (GPs) (Maguire 2001).

Intervention participants were significantly more likely to have discussed stopping smoking with pharmacy personnel (85.0% compared with 62.3% of the controls [$p = 0.00001$]) (Sinclair 1998). They also rated their discussion more highly, with 33.8% of the intervention group rating it as 'very useful' compared with 15.7% of the controls ($p = 0.048$). The majority of pharmacists and pharmacy assistants thought that: the Stages of Change model was a good way of understanding smoking cessation, that the training was a good learning experience and a good use of their time. They felt they had been able to utilise the training, that it had made a difference to the way they counselled customers, that it had helped them to help their customers, and that it had increased their job satisfaction (Sinclair 1997). One year after the training, the combined scores of the pharmacists and pharmacy assistants working in each pharmacy showed that the intervention pharmacy teams had a greater knowledge and understanding of the model, greater self-efficacy to counsel customers, and a more positive attitude about the outcome of smoking cessation counselling provided in community pharmacies than their control counterparts (Sinclair 1998b). Further annual follow-ups demonstrated the long-term benefit of the Stage of Change training over a three-year period, for both community pharmacists and their staff, on knowledge and attitudes (Sinclair 1999a).

The outcomes for each trial are displayed graphically as risk ratios with 95% confidence intervals. We also considered the effect of pooling the results. There was significant heterogeneity ($I^2 = 81\%$) (Higgins 2003), so a fixed effects model for pooling was not appropriate. Using a random effects model the pooled effect was not statistically significant (risk ratio 2.79, 95% CI 0.87 - 9.01).

DISCUSSION

The limited number of studies to date supports the possibility that trained community pharmacists, providing a support programme of counselling and record keeping for their customers, has a positive effect on smoking cessation rates (Sinclair 1998; Maguire 2001). A limitation to the strength of this conclusion is that the two studies had somewhat different effects. Maguire 2001 showed a large and statistically significant benefit, but the quit rate in the control group at 12 months was relatively low at only 2.7%, even though 84% began by using NRT. In contrast Sinclair 1998 did not show a statistically significant effect at any follow-up, although there was a consistent trend towards benefit from the intervention at all follow-up points.

Since many reviews of tobacco addiction do perform meta-analysis to combine the results of clinically similar trials, we considered whether pooling the data would have changed our conclusions. As expected there was significant statistical heterogeneity between the results of the two studies. Pooling using a fixed effects model was therefore inappropriate. Using a random effects model, the confidence interval around the estimate was very wide, and included 1. That is, no evidence was detected of a significant benefit. This supports the cautious conclusions of the review.

Although only limited evidence exists for the effectiveness of stage-based interventions in changing smoking behaviour (Riemsma 2003), both the pharmacy studies found that pharmacists valued the training and felt that an understanding of the Stages of Change model helped them to counsel their customers (Sinclair 1997; Maguire 2001). The training intervention had long-term benefits for the knowledge and attitudes of pharmacists and their staff over a three-year period (Sinclair 1999a) and was also associated with participants reporting increased and more highly rated counselling (Sinclair 1998). Pharmacy staff working on their own can make a positive contribution to the process and outcome of smoking cessation (Sinclair 1998; Maguire 2001), and other healthcare professionals can also make positive contributions to the smoking cessation process (Rice 2004; Lancaster 2004). However, much more could be achieved through a co-ordinated approach to interventions that use all members of the healthcare team (Lichtenstein 1996). Pharmacists have highlighted the importance of a multi-

disciplinary approach to smoking cessation and a need for improved relationships with local GPs (Maguire 2001). In the UK, the new National Health Service pharmacy contact, legislative changes and information technology developments are encouraging the integration of community pharmacy services into public health programmes provided by other primary care professionals (Noyce 2007). A recent survey of UK community pharmacists reported that 44% of responding pharmacists had been commissioned by their local primary care organisation to provide smoking cessation services (Inch 2007). There is also scope for interventions across secondary and primary care as demonstrated by an Australian smoking cessation programme involving counselling and nicotine patches, initiated in hospital and then continued by hospital- or community-based pharmacists, which was superior to minimal intervention without nicotine patches (Vial 2002). The main barriers to pharmacists becoming more actively involved in smoking cessation interventions are time constraints and insufficient remuneration (Maguire 2001). These barriers need to be addressed.

AUTHORS' CONCLUSIONS

Implications for practice

Interventions in which pharmacists were trained to provide a counselling and record keeping support programme for smokers, were associated with increased and more highly rated counselling, and may have a positive effect on smoking cessation rates. This indicates that community pharmacy personnel have the potential to make a significant contribution to smoking cessation targets. However, more might be achieved through a consistent, co-ordinated approach to smoking cessation interventions by a wide range of healthcare professionals across primary and secondary care.

The issues of time constraints and appropriate remuneration for pharmacy staff who provide smoking cessation support for their customers need to be addressed.

Implications for research

The limited number of studies to date suggests that trained community pharmacists, providing a counselling and record keeping support programme for their customers, can have a positive effect on smoking cessation rates. Both included trials trained pharmacists using the Stages of Change model. Further work is needed to confirm whether this and other training and support interventions are cost-effective beyond the UK community pharmacy setting.

Further work is also required to assess the clinical and cost effectiveness of co-ordinated interventions across primary and secondary care.

ACKNOWLEDGEMENTS

Amanda Lee provided statistical advice.

REFERENCES

References to studies included in this review

Maguire 2001 *{published data only}*

Maguire TA, McElnay JC, Drummond A. A randomized controlled trial of a smoking cessation intervention based in community pharmacies. *Addiction* 2001;**96**(2):325–31.

Sinclair 1998 *{published data only}*

Sinclair HK, Bond CM, Lennox AS. The longterm learning effect of training in stage of change for smoking cessation: a three year follow up of community pharmacy staff's knowledge and attitudes. *International Journal of Pharmacy Practice* 1999;**7**:1–11.

Sinclair HK, Bond CM, Lennox AS, Silcock J, Winfield AJ. An evaluation of a training workshop for pharmacists based on the Stages of Change model of smoking cessation. *Health Education Journal* 1997;**56**:296–312.

Sinclair HK, Bond CM, Lennox AS, Silcock J, Winfield AJ. Knowledge of and attitudes to smoking cessation: the effect of stage of change training for community pharmacy staff. *Health Bulletin* 1998;**56**:526–39.

* Sinclair HK, Bond CM, Lennox AS, Silcock J, Winfield AJ, Donnan PT. Training pharmacists and pharmacy assistants in the stages-of-change model of smoking cessation: a randomized controlled trial in Scotland. *Tobacco Control* 1998;**7**(3):253–61.

Sinclair HK, Silcock J, Bond CM, Lennox AS, Winfield AJ. The cost-effectiveness of intensive pharmaceutical intervention in assisting people to stop smoking. *International Journal of Pharmacy Practice* 1999;**7**:107–12.

References to studies excluded from this review

Anderson 2002 *{published data only}*

Anderson C, Mair A. Pro-change: adult smokers program: Northumberland pilot. *International Journal of Pharmacy Practice* 2002;**10**:281–7.

Babar 2007 *{published data only}*

Babar ZU, Bukhari NI, Sarwar W, Efendie B, Pereira R, Mohamed MH. A preliminary study on the effect of pharmacist counseling on awareness of and willingness to quit smoking in Malaysian population. *Pharmacy World & Science* 2007;**29**(3):101–103.

Baluch 1995 *{published data only}*

Baluch WM. Pharmacists role in a smoking-cessation program at a health maintenance organization. *American Journal of Health-system Pharmacy* 1995;**52**:287–93.

Barnes 2006 *{published data only}*
Barnes J, Barber N, Wheatley D, Williamson EM. A pilot randomised, open, uncontrolled, clinical study of two dosages of St John's wort (Hypericum perforatum) herb extract (LI-160) as an aid to motivational/behavioural support in smoking cessation. *Planta Medica* 2006;**72**(4):378–382.

Carroll 2000 *{published data only}*
Carroll P, Fois R, Sarson D, Flynn J. A community pharmacy-based program using transdermal nicotine replacement therapy-actions and outcomes. *Australian Pharmacist* 2000;**19**(1):51–5.

Dent 2004 *{published data only}*
Dent LA, Scott JG, Lewis E. Pharmacist-managed tobacco cessation program in Veterans Health Administration community-based outpatient clinic. *Journal of the American Pharmacists Association (JAPha)* 2004;**44**:700–14.

Doescher 2002 *{published data only}*
Doescher MP, Whinston MA, Goo A, Cummings D, Huntington J, Saver BG. Pilot study of enhanced tobacco-cessation services coverage for low-income smokers. *Nicotine and Tobacco Research* 2002;**4 Suppl 1**:S19–S24.

Gauen 1995 *{published data only}*
Gauen SE, Lee NL. Pharmacists role in a smoking-cessation program at a managed health-care organization. *American Journal of Health-system Pharmacy* 1995;**52**:294–6.

Hasford 2003 *{published data only}*
Hasford J, Fagerstrom KO, Haustein KO. A naturalistic cohort study on effectiveness, safety and usage pattern of an over-the-counter nicotine patch. Cohort study on smoking cessation. *European Journal of Clinical Pharmacology* 2003;**59**(5-6):443–7.

Howard-Pitney 1999 *{published data only}*
Howard-Pitney B, Killen JD, Fortmann SP. Quitting chew: results from a randomized trial using nicotine patches. *Experimental and Clinical Psychopharmacology* 1999;**7**(4):362–71.

Kennedy 2002 *{published data only}*
Kennedy DT, Giles JT, Chang ZG, Small RE, Edwards JH. Results of a smoking cessation clinic in community pharmacy practice. *Journal of the American Pharmaceutical Association* 2002;**42**(1): 51–6.

McEwen 2006 *{published data only}*
McEwen A, West R, McRobbie H. Effectiveness of specialist group treatment for smoking cessation vs. one-to-one treatment in primary care. *Addictive Behaviors* 2006;**31**(9):1650–1660.

Mochizuki 2004 *{published data only}*
Mochizuki M, Hatsugaya M, Rokujoh E, Arita E, Hashiguchi M, Shimizu N, et al.[Randomized controlled study on the effectiveness of community pharmacists' advice for smoking cessation by Nicorette--evaluation at three months after initiation]. *Yakugaku Zasshi: Journal of the Pharmaceutical Society of Japan* 2004;**124**: 989–95.

Prokhorov 2006 *{published data only}*
Prokhorov AV, Luca N, Marani S, Wetter D, Lovong D, Hudmon KS, Fouladi RT. Training physicians and pharmacists in smoking cessation counseling: preliminary results (POS2-69). Society for Research on Nicotine and Tobacco 12th Annual Meeting February 15-18, Orlando, Florida. 2006.

Roth 2001 *{published data only}*
Roth MT, Westman EC. Use of bupropion SR in a pharmacist-managed outpatient smoking-cessation program. *Pharmacotherapy* 2001;**21**(5):636–41.

Sonderskov 1997 *{published data only}*
Sonderskov J, Olsen J, Meillier L, Overvad OK, Sabroe S. [The effect of transdermal nicotine patches in smoking cessation. A randomized trial in pharmacy customers in Denmark] [Danish] [Effekten af transdermalt nikotinplaster ved rygeafvaenning. En randomiseret undersogelse blandt apotekskunder i Danmark]. *Ugeskrift for laeger* 1999;**161**(5):593–7.
Sonderskov J, Olsen J, Sabroe S, Meillier L, Overvad K. Nicotine patches in smoking cessation: A randomized trial among over- the-counter customers in Denmark. *American Journal of Epidemiology* 1997;**145**(4):309–18.

Swartz 1995 *{published data only}*
Swartz SH, Ellsworth AJ, Curry SJ, Boyko EJ. Community patterns of transdermal nicotine use and provider counseling. *Journal of General Internal Medicine* 1995;**10**(12):656–62.

Vial 2002 *{published data only}*
Vial RJ, Jones TE, Ruffin RE, Gilbert AL. Smoking cessation program using nicotine patches linking hospital to the community. *Journal of Pharmacy Practice and Research* 2002;**32**(1):57–62.

Vitale 2000 *{published data only}*
Vitale F. Professional intervention for smoking cessation: The contribution of the pharmacist. *European Journal of Public Health* 2000;**10**(3 Suppl):21–4.

Additional references

Altman 1982
Altman DG, Gore SM. *Statistics in Practice*. London: British Medical Association, 1982.

Altman 1997
Altman DG, Bland JM. Statistical notes. Units of analysis. *BMJ* 1997;**314**:1874.

Anderson 2003
Anderson C, Blenkinsopp A, Armstrong M. Pharmacists' perceptions regarding their contribution to improving the public's health: A systematic review of the United Kingdom and international literature 1990-2001. *International Journal of Pharmacy Practice* 2003;**11**:111–20.

Barbero 2000
Barbero Gonzalez JA, Quintas Rodriguez AM, Camacho JE. [Smoking cessation from the community pharmacy] [Spanish]. *Atencion Primaria* 2000;**26**(10):693–6.

Blenkinsopp 2002
Blenkinsopp A, Tann J, Platts A, Allen J. Evaluation of feasibility and acceptability of a community pharmacy health promotion scheme - Views of users and providers. *Health Education Journal* 2002;**61**:52–69.

Blenkinsopp 2003
Blenkinsopp A, Anderson C, Armstrong M. Systematic review of the effectiveness of community pharmacy- based interventions to reduce risk behaviours and risk factors for coronary heart disease. *Journal of Public Health Medicine* 2003;**25**:144–53.

Corelli 2005
Corelli RL, Kroon LA, Chung EP, Sakamoto LM, Gundersen B, Fenlon CM, et al.Statewide evaluation of a tobacco cessation curriculum for pharmacy students. *Preventive Medicine* 2005;**40**: 888–95.

Crealey 1998
Crealey GE, McElnay JC, Maguire TA, O'Neill C. Costs and effects associated with a community pharmacy-based smoking-cessation programme. *Pharmacoeconomics* 1998;**14**:323–333.

Gschwend 1999
Gschwend P, Steffen T, Hersberger K, Ackermann-Liebrich U. [Smoking cessation in pharmacies - evaluation of the smoking cessation campaign "tobacco adieu!" among pharmacists in Basle] [German] [Raucherentwohnung in Apotheken—-Evaluation der Raucherentwohnungskampagne "Tabak adieu" der Apotheker/ –innen beider Basel]. *Sozial- und Praventivmedizin* 1999;**44**:14–21.

HEA 1994
Health Education Authority. *Health promotion and the community pharmacist*. London: HEA, 1994.

Higgins 2003
Higgins JP, Thompson SG, Deeks JJ, Altman DG. Measuring inconsistency in meta-analyses. *BMJ* 2003;**327**(7414):557–60.

Hudmon 2001
Hudmon KS, Corelli RL, Kroon LA, Shreve MS, Prokhorov AV. Reducing pulmonary disease: The pharmacist's role in smoking cessation. *Journal of Pharmacy Practice* 2001;**14**(2):143–59.

Hudmon 2003
Hudmon KS, Hemberger KK, Corelli RL, Kroon LA, Prokhorov AV. The pharmacist's role in smoking cessation counseling: perceptions of users of nonprescription nicotine replacement therapy. *Journal of the American Pharmacists Association (JAPha)* 2003;**43**:573–82.

Hudmon 2004
Hudmon KS, Kroon LA, Corelli RL, Saunders KC, Spitz MR, Bates TR, Liang D. Training future pharmacists at a minority educational institution: evaluation of the Rx for change tobacco cessation training program. *Cancer Epidemiology Biomarkers & Prevention* 2004;**13**:477–81.

Hudmon 2005
Hudmon KS, Bardel K, Kroon LA, Fenlon CM, Corelli RL. Tobacco education in U.S. schools of pharmacy. *Nicotine & Tobacco Research* 2005;**7**:225–32.

Inch 2007
Inch J, Bond CM, Blenkinsopp A, Celino G. Progress in implementing the community pharmacy contractual framework: provision of essential and enhanced services. *International Journal of Pharmacy Practice* 2007;**15 Supplement 2**:B50.

Lancaster 2000
Lancaster T, Silagy C, Fowler G. Training health professionals in smoking cessation. *Cochrane Database of Systematic Reviews* 2000, Issue 3.[Art. No.: CD000214. DOI: 10.1002/ 14651858.CD000214]

Lancaster 2004
Lancaster T, Stead L. Physician advice for smoking cessation. *Cochrane Database of Systematic Reviews* 2004, Issue 4.[Art. No.: CD000165. DOI: 10.1002/14651858.CD000165.pub3]

Lichtenstein 1996
Lichtenstein E, Hollis JF, Severson HH, Stevens VJ, Vogt TM, Glasgow RE, et al.Tobacco cessation interventions in health care settings: rationale, model, outcomes. *Addictive Behaviors* 1996;**21**: 709–720.

Maguire 1995
Maguire T. Smoking cessation: a model service for UK community pharmacists. *International Journal of Smoking Cessation* 1995;**4**: 18–21.

Maguire 1996
Maguire T. Pharmaceutical care - a realistic pharmaceutical service. *Pharmacy Today* 1996;**7**:20–4.

Maguire 1997
Maguire 1997. Smoking cessation, nicotine replacement therapy and community pharmacy. *Pharmaceutical Journal* 1997;**258**: 239–40.

McGhan 1996
McGhan WF, Smith MD. Pharmacoeconomic analysis of smoking-cessation interventions. *American Journal of Health System Pharmacy* 1996;**53**(1):45–52.

Noyce 2007
Noyce PR. Providing patient care through community pharmacies in the UK: policy, practice, and research. *Annals of Pharmacotherapy* 2007;**41**(5):861–868.

Rice 2004
Rice VH. Stead LF. Nursing interventions for smoking cessation. *Cochrane Database of Systematic Reviews* 2004, Issue 1.[Art. No.: CD001188. DOI: 10.1002/14651858.CD001188.pub3]

Riemsma 2003
Riemsma RP, Pattenden J, Bridle C, Sowden AJ, Mather L, Watt IS, Walker A. Systematic review of the effectiveness of stage based interventions to promote smoking cessation. *BMJ* 2003;**326** (7400):1175–7.

RPS 1999
Royal Pharmaceutical Society of Great Britain. Pharmacists' ethical and professional performance: a consultation document on a new code of ethics. *The Pharmaceutical Journal* 1999;**263**:CE1–10.

Silagy 2004
Silagy C, Lancaster T, Stead L, Mant D, Fowler G. Nicotine replacement therapy for smoking cessation. *Cochrane Database of Systematic Reviews* 2004, Issue 3.[Art. No.: CD000146. DOI: 10.1002/14651858.CD000146.pub3]

Sinclair 1997
Sinclair HK, Bond CM, Lennox AS, Silcock J, Winfield AJ. An evaluation of a training workshop for pharmacists based on the Stages of Change model of smoking cessation. *Health Education Journal* 1997;**56**:296–312.

Sinclair 1998b
Sinclair HK, Bond CM, Lennox AS, Silcock J, Winfield AJ. Knowledge of and attitudes to smoking cessation: the effect of stage

of change training for community pharmacy staff. *Health Bulletin* 1998;**56**:526–39.

Sinclair 1999a

Sinclair HK, Bond CM, Lennox AS. The longterm learning effect of training in stage of change for smoking cessation: a three year follow up of community pharmacy staff's knowledge and attitudes. *International Journal of Pharmacy Practice* 1999;**7**:1–11.

Sinclair 1999b

Sinclair HK, Silcock J, Bond CM, Lennox AS, Winfield AJ. The cost-effectiveness of intensive pharmaceutical intervention in assisting people to stop smoking. *International Journal of Pharmacy Practice* 1999;**7**:107–12.

Smith 1995

Smith MD, McGhan WF, Lauger G. Pharmacist counseling and outcomes of smoking cessation.. *American Pharmacy* 1995;**NS35** (8):20-9, 32.

Tran 2002

Tran MT, Holdford DA, Kennedy DT, Small RE. Modeling the cost-effectiveness of a smoking-cessation program in a community pharmacy practice. *Pharmacotherapy* 2002;**22**:1623–31.

West 2000

West R, McNeill A, Raw M. Smoking cessation guidelines for health professionals: an update.. *Thorax* 2000;**55**:987–99.

Wick 2000

Wick M, Ackermann-Liebrich U, Bugnon O, Cerise C. Evaluation of the "future non-smokers" campaign of the Swiss Society of Pharmacists [Evaluation der Kampagne "Kunftige Nichtraucher" des Schweizerischen Apothekerverbands]. *Sozial- und Praventivmedizin* 2000;**45**(2):73–84.

Williams 2000

Williams DM, Newsom JF, Brock TP. An evaluation of smoking cessation-related activities by pharmacists. *Journal of the American Pharmaceutical Association* 2000;**40**:366–70.

Zillich 2002

Zillich AJ, Ryan M, Adams A, Yeager B, Farris K. Effectiveness of a pharmacist-based smoking-cessation program and its impact on quality of life. *Pharmacotherapy* 2002;**22**:759–65.

* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Maguire 2001

Methods	Setting: community pharmacies in Northern Ireland and in London, England. Recruitment inclusion criteria: smokers expressing a wish to stop smoking, >18 years, not pregnant, no minimum cigarettes/day. Recruitment period 14 months. Recruitment limited to 12 per pharmacy. Randomization: by customer; using sealed envelope technique
Participants	100 pharmacists in Northern Ireland and 24 in London: 51 pharmacies enrolled eligible subjects. 484 smokers (265 intervention [60% male, age: 17-69, mean 42; 74% smoked 10-20 cigarettes/day, 87% started to use NRT]; 219 control [56% male, age: 25-72, mean 38; 55% smoked 10-20 cigarettes/day, 84% started to use NRT]
Interventions	Three-hour training workshop for pharmacists plus one support visit to each pharmacist. The workshop covered epidemiology, smoking statistics, NRT use, cycle of change model and Pharmacists' Action on Smoking (PAS) model. The PAS intervention involved structured counselling programme, information leaflet and record keeping. They were required to attend a weekly follow-up for the first 4 weeks then monthly for 3 months as needed
Outcomes	Self-reported continuous abstinence at 3, 6 and 12 months. Validation: cotinine at 12 months on subjects reporting 12 months of abstinence (n=44)
Notes	Pharmacists paid £15 per smoker enrolled and followed up for 12 months. No recruit attended for counselling after 4 weeks

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Sinclair 1998

Methods	Setting: rural community pharmacies, Grampian, Scotland. Recruitment inclusion criteria: pharmacy customers seeking advice on stopping smoking or buying an OTC anti-smoking product in preparation for a new attempt to stop smoking. Recruitment period 12 months. No limit to number of recruits per pharmacy. Randomization: by pharmacy; stratified by type (national multiple, or proprietor-owned), ranked by pharmacist's motivation (date of joining study), then sequential allocation to training or no training
Participants	62 community pharmacies (31 intervention, 31 control): 60 pharmacies enrolled eligible subjects. Training intervention attended by all intervention pharmacies: 40 pharmacists (25 women, 15 men), 54 assistants (all women). 492 smoker/customers (224 intervention [61% female, age: 17-74, mean 42, 98% used anti-smoking product, mean socio-economic status 3.0, mean Fagerstrom test for nicotine dependence (FTND) 5.2] 268 control [63% female, age: 17-77, mean 42, 93% used anti-smoking product (mostly

Sinclair 1998 (*Continued*)

	NRT), mean socio-economic status 3.4, mean FTND 5.2). Subjects lost to follow-up (addressee unknown) : 1 month (3 intervention, 9 controls); 4 months (4 intervention, 2 controls). Subjects at 9 months: 217 intervention, 257 controls.
Interventions	Two-hour training workshop for pharmacists and pharmacy assistants: based on stages of change model and communication skills for negotiating change and providing ongoing support; no focus on smoking cessation products. Trained pharmacy staff offered customers the Pharmacy Support Programme which involved client registration, counselling and ongoing record keeping at each subsequent purchase
Outcomes	Self-reported point prevalence at 1 month, continuous abstinence at 4 and 9 months Validation: none
Notes	No additional pharmacy reimbursement. Evaluated effects of clustering by calculating intra-cluster correlation coefficients for each outcome. Concluded no evidence of significant cluster effect.

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	No	C - Inadequate

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Anderson 2002	Feasibility study. No six month follow-up. No comparators.
Babar 2007	No control group
Baluch 1995	No control group
Barnes 2006	No control group. All participants received pharmacist support and St John's Eprt.
Carroll 2000	No control group
Dent 2004	No control group
Doescher 2002	No control group
Gauen 1995	No control group
Hasford 2003	No control group (Evaluated over-the-counter nicotine patch)
Howard-Pitney 1999	Randomized to receive NRT or placebo; both groups received same behavioural treatment.

(*Continued*)

Kennedy 2002	No control group
McEwen 2006	Non randomised study with four week follow-up. Some individual counselling participants were treated by pharmacists
Mochizuki 2004	Randomised study with only 3 months follow-up. (Pilot study, 28 participants)
Prokhorov 2006	Study of pharmacist & physician training with 3 month follow-up, smoking cessation outcomes not reported in abstract
Roth 2001	No control group
Sonderskov 1997	NRT versus placebo, no other intervention.
Swartz 1995	No control group
Vial 2002	Participants did not meet the criteria for consideration in this review i.e. were not community pharmacy clients who were smokers wishing to stop. Participants recruited in a hospital setting and randomized to one of three arms of the study. Support programme of counselling and nicotine patches initiated in hospital with the first consultation with a research pharmacist common to two groups then continued by hospital- or community pharmacy-based pharmacists compared with minimal intervention without nicotine patches
Vitale 2000	Descriptive paper, no control group

DATA AND ANALYSES

Comparison 1. Intervention versus control

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Cessation at longest follow-up	2		Risk Ratio (M-H, Fixed, 95% CI)	Totals not selected

Analysis 1.1. Comparison 1 Intervention versus control, Outcome 1 Cessation at longest follow-up.

Review: Community pharmacy personnel interventions for smoking cessation

Comparison: 1 Intervention versus control

Outcome: 1 Cessation at longest follow-up

Study or subgroup	Treatment n/N	Control n/N	Risk Ratio M-H,Fixed,95% CI	Risk Ratio M-H,Fixed,95% CI
Maguire 2001	38/265	6/219		5.23 [2.25, 12.15]
Sinclair 1998	26/217	19/257		1.62 [0.92, 2.85]

WHAT'S NEW

Last assessed as up-to-date: 30 October 2007.

Date	Event	Description
18 June 2008	Amended	Converted to new review format.

HISTORY

Protocol first published: Issue 3, 2002

Review first published: Issue 1, 2004

Date	Event	Description
31 October 2007	New search has been performed	Search update for Issue 1, 2008. No new studies included. New references added to the Excluded studies and Background.

CONTRIBUTIONS OF AUTHORS

KH and CM extracted data and wrote the review; LS searched for trials, and edited final version of the review. All authors contributed to a minor update of the review for issue 1, 2008.

DECLARATIONS OF INTEREST

HK Sinclair and CM Bond were the principal investigators in one of the studies included in this review.

SOURCES OF SUPPORT

Internal sources

- University of Aberdeen, UK.
- Department of Primary Health Care, University of Oxford, UK.

External sources

- NHS Research & Development Programme, UK.

INDEX TERMS

Medical Subject Headings (MeSH)

*Pharmacies; *Pharmacists; *Smoking Cessation; Counseling; Health Promotion; Randomized Controlled Trials as Topic

MeSH check words

Humans